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CONTENTS

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PROCEDURES FOR PLANNING, OPERATING SPECIALIZED LIVESTOCK UNITS REVIEWED

Moscow IZVESTIYA TIMERYAZEVSKOY SEL'SKOKHOZYAYSTVENNOY AKADEMII in Russian No 2, Mar-Apr 81 pp 175-181

[Article by S. I. Gryadov, department of the organization of socialist agricultural enterprises: "The Organization of Flow Production in Livestock Raising under Conditions of Industrialization"]

[Text] The gradual introduction of industrial methods that is being carried out in all sectors of agricultural production in the current phase of its development is the principal line of scientific-technical progress in USSR agriculture and a constitutent part of the program toward further specialization and concentration and raising the technical level. Industrial methods are being introduced especially vigorously in the animal husbandry sectors as the result of the increase in recent years in the degree of specialization and concentration of animal husbandry production based on interfarm cooperation and agroindustrial integration, the rise in the level of mechanization of the work processes, incorporation of progressive technologies, improvement in the organization of labor, and rise in the general sophistication of management.

The economic literature is devoting considerable attention to the industrialization of agricultural production, including the sectors of animal husbandry [2, 3, 5, 7, and others]. This process is analyzed quite thoroughly, but many authors give different definitions of the essential features and content of the process. In this article we will not be able to present the different viewpoints as to the essential features and content of industrialization. Therefore, we will note that, in our opinion, the most important characteristics of industrial-type animal husbandry complexes and units, the features that distinguish them from ordinary kolkhoz and sovkhoz livestock units, are the following: large scale of production; high level of specialization; rational organization of work processes (milking cows, preparing and distributing feed, and so on); flow processes based on full mechanization and partial automation of production; application of progressive techniques of animal maintenance; availability of animals with a high and uniform level of productivity, adapted for intensive exploitation under the specific conditions of these complexes and units; full supply of livestock feed throughout the year and efficient use of it; rational organization of the labor of employees (use of progressive forms of division and cooperation of labor, and the schedule of work and rest); comprehensiveness of construction and use of new building techniques.

At the same time, it is perfectly obvious that the production process in different sectors of animal husbandry differs significantly from the similar process in most industrial sectors, even with a high level of concentration and mechanization. These differences are a result of the fact that the production process here is based on utilizing a number of biological functions of the animal. Therefore, rational organization is possible only with due regard for all of these functions. For example, complexes involved in raising and feeding out young cattle must consider that in different periods of growth the requirements of the animals for maintenance conditions, like their growth energy, differ. The maintenance procedure, feed expenditure norms, and structure of the diet must be modified in conformity with this.

It follows from what has been said that in the strict sense of the word the process of industrialization of production in animal husbandry, just as in other sectors of agriculture, cannot be considered to be transferring it to an industrial basis, although the phrase "transferring agriculture to an industrial basis" has become widespread in agricultural economic literature. We agree with the view of those authors [3] who believe that in all cases the basis of agricultural production remains biological and the subject of discussion in this case is the introduction of industrial methods in agricultural production. The phrase "transferring agriculture to an industrial basis" can only be used as a conventional term for the process of industrialization in view of the fact that it has become fairly widespread in the economic literature.

Of course, the most typical characteristics of any industrial production are its continuity and flow quality. This applies fully to the sectors of agriculture when industrial methods are introduced in them. The industrialization of animal husbandry should be based on steady year-round production of output using fully mechanized and automated flow technology lines with maximum specialization of the labor of service personnel and a high level of standardization of all the elements of production (the herd of livestock, feed, and output).

Flow production produces the greatest economic benefit when it is rhythmic, when the arrival, movement, and departure of animals and production of a definite quantity of output occur at definite, predetermined time intervals. Irregularity in these processes with large-scale production significantly diminishes the efficiency of using expensive equipment and structures.

Rhythmic flow production presupposes coordinated (on the basis of preset schedules), harmonious work by all its elements: enterprises, their production subdivisions, shops, sections, and individual workers. In the agricultural economic literature, however, the organization of rhythmic flow production in animal husbandry sectors is often analyzed and planned only with application to the production subdivision and becomes a matter, for example, of organizing production shops at livestock complexes and units, forming production groups of animals in the shops, and so on [1, 5, 8, and others].

But when specialized (in the production of a particular type of livestock output) enterprises are established within interfarm production associations

or administrative regions and large specialized livestock units and complexes are organized at these enterprises, conditions also arise for mass flow production of output on the principle of continuous flow production at a predetermined rate. The closed production cycle for animal husbandry output within the interfarm association or administrative region determines the interrelationship and interdependence among all the farms that belong to this association (region) and all the livestock units of the particular farm. In an organizational sense this leads to the creation of specialized shops, the introduction of progressive forms of labor organization, and new production technology.

But the specialized literature has given little attention to the questions of organizing flow production within the system of interacting enterprises of an interfarm association or administrative region [4, 5, 6, 9]. For this reason, the present article considers together the methodological questions of organizing and planning flow production in industrial livestock raising under conditions of highly developed production specialization and concentration and interfarm cooperation. The calculations given below may be of practical significance within an administrative region or interfarm association for the production of livestock output with a closed or semiclosed production cycle. Similar calculations can be made for a particular farm with substantiation of herd size at particular specialized livestock complexes and units given specialization within the farm.

The first thing that must be done to insure flow production is to establish definite quantitative ratios among the specialized enterprises (or subdivisions of a particular enterprise) that produce different types of output. This means that the enterprise (or the production subdivision of the farm) which specializes, for example in raising heifers and cows calving for the first time for kolkhozes and sovkhozes belonging to the production association or for all the livestock complexes and farms of the particular farm, should have sufficient capacity to fully meet the needs of the farms for this type of output.

A number of conditions must be taken into account to determine the need: the growth rate of the cow herd at the farm (group of cooperating farms); the period of service of the cows and level of annual removal from the herd; the scale of culling of cows calving for the first time based on level of productivity and suitability for machine technology, and the scale of culling of heifers during their early growth; the age of heifers at first insemination; the commercial production of calves.

The capacity of specialized enterprises (complexes, units) for raising heifers and cows calving for the first time (E) can be determined by the formula

$$E = N(K+T)AB/100,$$

where N is the number of cows in the interfarm association, administrative region, or individual enterprise; K is the annual norm of culling of cows at dairy farms (units, complexes) in percentage; T is the annual rate of expanded reproduction of the cow herd, in percentage; A is the number of years necessary for full herd turnover; B is a coefficient that takes account of the culling of heifers and cows calving for the first time during

their early growth (the total number of livestock places must be greater by the number of animals culled annually than the number of animals planned to be turned over to other farms).

Assume that we must substantiate the capacity of two enterprises which are set up within an interfarm production association to raise replacement animals and cows calving for the first time. One of them should engage in raising heifers until the sixth month of pregnancy, while the other keeps the heifers in the concluding stage of the pregnancy, organizes their calving, and increases the milk yield of the first-time mothers for three months of the first lactation.

Animals are kept at the first enterprise for 24 months (given an age of 18 months for the first insemination), that is, full turnover is completed in two years. If the entire production association has 10,000 cows, the level of culling is 25 percent, annual growth is five percent, and culling of heifers during the year is 50 percent of the total herd, the capacity of this enterprise should be 6,900 head: $[10,000 \cdot (25+5) \cdot 2 \cdot 1.15]/100$. Because full herd turnover takes two years, this enterprise should receive half of its capacity, that is 3,450 head, of replacement calves each year.

The second enterprise keeps the animals for six months (they arrive after the sixth month of pregnancy and leave after the third month of lactation), that is, the herd turns over twice in one year. In this case the number of cows calving for the first time in one cycle should be 1,500: $[10,000 \cdot (25 + 5) \cdot 0.5]/100$. However, the total capacity of the enterprise in terms of number of places should take into account the culling of first-time mothers based on the results of the increase in milk yield during the first three months of lactation. If culling is 25 percent of the herd, then the specialized enterprise should have room for 1,875 cows ($1,500 \cdot 1.25$). In this case, the enterprise will sell 3,000 cows that have calved for the first time to dairy farms each year (1,500 head in each cycle).

The capacity of an enterprise (complex or unit) which is part of an interfarm association or specializes in raising young animals beyond replacement needs and preparing them for final feeding out is determined in a similar manner.

But if the specialized enterprises (complexes or units) for raising replacement animals or raising and feeding out young animals beyond replacement needs have already been established and their capacities are known, it is necessary to establish the number of cows at dairy farms whose offspring must be sent to these enterprises (complexes or units). For example, the number of cows (M) that dairy kolkhozes and sovkhozes must have to receive a sufficient number of young animals to send to the complexes for raising and feeding out may be determined by the formula

$$M = (HA \cdot 100)/0.5B,$$

where H is the number of he-calves delivered to the complex in the course of a year (established with due regard for the capacity of the enterprise, that is, the number of places and accepted norms for culling and epidemics);
A is a coefficient that makes it possible to consider the seasonality of

arrival of young animals and the fact that some of the he-calves do not meet the requirements for selection for the herd of the complex (determined by the experience of past years); B is the production of calves per 100 cows and heifers, in number of head ; 0.5 is the birthrate of he-calves.

Based on the resulting value of M, the appropriate specific dairy farms should be selected and production ties established among these enterprises. It must be considered here that the number of cattle being fed out at replacement farms is usually greater than the number of he-calves received from the dairy farms because the herd also includes a large number of she-calves received from first-time mothers and she-calves culled from the replacement group at different stages of raising. But because it is desirable to concentrate animals of one sex at an enterprise for raising and feeding out cattle, these she-calves should be raised and fed out at specialized units of the particular farm or at specialized enterprises organized on an interfarm basis.

A similar calculation is made at dairy farms for the number of breeding cows whose offspring should be used to supply livestock units and complexes engaged in raising replacement animals (the other cows at these farms can be inseminated with the sperm of beef bulls to obtain mixed-breed calves that can be raised for meat). The number of breeding cows determined by these calculations should be increased in view of the fact that the she-calves from first-time mothers are usually not used for herd reproduction and also because some of the replacement she-calves will be culled during the period of growth.

Organizing flow production in livestock raising also presupposes breaking down the herd of cows and other groups of animals at the livestock complex or unit into shops and groups that are the same for certain characteristics. This makes it possible to solve the questions of herd reproduction better, use feed more rationally, and make more efficient use of milking machines, other equipment, and buildings. Operating single-type shops and groups creates favorable conditions for furthering the division of labor, raising the labor productivity of employees, and improving their qualifications. This is why the question of forming production shops and production groups of animals at livestock complexes and units under conditions of industrialization of production has received considerable attention in recent years [1, 5, 8, 10, and others].

The main principle that must be considered in forming production shops and production groups of animals in a particular shop is the similarity of the animals for a set of characteristics. For example, to form a single-type group of cows at a dairy unit or complex, it is necessary to take account of their physiological condition, stage of lactation, average daily milk yield, productivity during the preceding lactation, rate of giving milk, age, live weight, and other characteristics. Under production conditions, however, it is practically impossible to create the i l group that takes account of all these indicators at the same time. Th fore, most scientists and practical workers reasonably believe that the decisive factors here are physiological conditions and level of productivity of the animals (average daily milk production for cows). In terms of physiological conditions the cows are usually divided into three shops: the milk herd, the interlactation

division, and the calving division. Large livestock units and complexes also have a shop for insemination of cows and building up milk yields. As for the criteria to identify production groups of animals, for the milk herd shop, for example, the characteristic may be either daily milk yield or stage of lactation. Identifying groups of animals by any of these characteristics has strong points and weaknesses. Thus, grouping milk cows by level of daily productivity regardless of stage of lactation makes it possible to use "herringbone parlor" type milkers more productively, but in this case it becomes more difficult to organize correctly the process of building up milk yield and feeding cows with new calves and to conduct artificial insemination of the animals. In addition, regular regrouping of the animals is required to maintain groups with similar productivity; this causes stress phenomena and leads to a decline in cow productivity [8].

When groups of cows are formed based on the stage of lactation, the cows that have calved in a certain time interval go from the calving division to a single group regardless of the amount of daily milk yield and remain in this group for most of the lactation period. This makes it easier to conduct various veterinary procedures, but it also makes it impossible to milk the cows in herringbone parlor units.

We think that the principle of forming production groups of cows in the milk stage (in a production shop) should be determined by the type of milking installation available or planned for installation at the particular livestock complex or unit. If a herringbone parlor type installation is being used, the group of cows in the milk herd should be formed with due regard for daily productivity, even though periodic regroupings of the animals are inevitable in this case. But if the unit has a milking installation which permits milking cows with different levels of productivity at the same time (a milk line, tandem, UDS-3, and other), it is better to make up the production group based on stage of lactation.

When a livestock complex or unit is introducing flow technology it is essential to know how many places for livestock each specialized shop (milk cows, calving division, and the like) must have. We present below a methodology for calculating the number of places for livestock that was proposed by V. A. Yakovlev [10] and modernized by us.

If the complex or unit does not have a check yard to test first-time mothers for productivity and other economically useful characteristics and the heifers arrive directly in the shop for interlactation cows, the number of places in each shop (N) necessary for full herd maintenance in any season can be calculated by the formula:

$$N = MDK/T,$$

where M is the capacity of the complex or unit in number of cows; D is the length of time that cows spend in the shop in days; T is the length in days of the full production cycle of cow use (equal to the average length of pregnancy plus the average length of the service); and, K is the coefficient of irregularity of calving (determined as the ratio of the largest number of calvings in a month to the smallest).

For example, where M = 1,200 head D = 100 days, T = 365 days, and K = 1.1, the number of places in the shop to build up milk production will be 362 (1,200·100·1.1/365).

It follows from this formula that the number of places for cattle in particular shops and at the complex or unit as a whole increases with an increase in the seasonality of calvings.

When the complex or unit has a test yard to prepare heifers for calving, conduct the calving, and build up the milk yield of first-time mothers the number of places for cattle in each shop is calculated as follows

$$N_k = [M(D_n + D_p)\ K \cdot V]/T,$$

$$N_p = MDK/T,$$

$$N = [MDK_k(1 - V)]/T,$$

where N_k, N_p, and N are the number of places for livestock in the test yard, production shop (milk herd), and other shops respectively; D_n and D_p are the length of time spent in the test yard by heifers before calving and first-time mothers respectively, in days; K_n, K_k, and K are the coefficients of irregularity of calving for, respectively, heifers, cows, and the average of both heifers and cows; and, V is the coefficient of culling of cows at the complex or unit.

At interfarm production associations to produce livestock output the complexes or units of specialized enterprises to raise cows calving for the first time play the role of the check yard.

In simplified terms the number of places for livestock in each shop of the complex or unit may be calculated considering the length of the stay of the cows in the particular shop. If the average length of the interlactation period of cows at the farm is 60 days, the time spent by cows in the calving division is 20-25 days, and the time spent in the milk herd is 280-285 days; the number of interlactation cows in the herd is 16.4 percent, while in the calving division it is 6.0 percent, and milk cows (including the shops for building up milk yield and insemination) comprise 77.6 of the total herd. This ratio is what determines the number of places in each shop.

Observance of a set rhythm is an essential condition for the organization of flow production at a livestock complex or unit. This rhythm is characterized by two indicators: duration and capacity. With respect to livestock complexes or units the duration of the rhythm (P_r) is the number of days required to form a production group of cows. It takes the same number of days to transfer groups of cows already formed from one shop to another (for example, from the milk herd shop to the shop for interlactation cows). The capacity of the rhythm (M_r) is the number of animals in the particular production group. The indicators of rhythm are determined by the formulas:

$$P_r = M_r T/M; \quad M_r = MP/T.$$

There are two ways to calculate the indicators of rhythm.

1. The size of the production group of cows, which depends on the size of the complex or unit, the type of milking installation, the level of milk productivity of the cows, and other conditions, is a known (given) quantity. This method is better suited for unconfined maintenance of animals where the size of the group is determined primarily by the one-time capacity of the milking installation. For example, for a herringbone parlor with 32 stalls the group of cows kept in one section should be 32 head (so that cows from different groups are not in the milking installation at the same time). In this case, where M = 1,200 cows and T = 365 days, P = 10 days (32 head · 365 days/1,200 head). This means that it will take 10 days at this complex to form a production group of 32 cows following the principles of flow production. This also means that a group of cows formed earlier should be transferred from one shop to another every 10 days.

2. The duration of the rhythm, which is usually set at 7 or 14 days, is a known (given) quantity. With a weekly rhythm the transfer of animals from one shop to another is done on a definite day of the week that is convenient for production; the time for this procedure can be envisioned when drawing up the schedule of the working day. This method of calculation is more suitable for complexes and units with confined maintenance of cows and milking in stalls using a milk line. Where M = 1,200 cows, P = 7 days, and P = 365 days, M_r = 23 head (1,200 head · 7 days/365 days), whereas where P_r = 14 days M_r = 46 head.

Therefore, the number of production groups in each shop N_{ts} and for the complex as a whole (N_k) with a set duration of the rhythm (P_r) can be calculated as follows:

$$N_{ts} = D/P; \quad N_k = T/P.$$

Where P_r = 7 and the time that cows spend in the shop for building milk yield and insemination is 100 days, for example, 14 groups should be formed (100 days/7 days). For an entire complex with a herd of 1,200 cows, 52 groups of 23 head apiece should be formed (365 days/7 days).

The primary shop in which the production groups of cows are formed may be the calving division or the shop for building up milk yield and insemination.

In the first case the cows after calving go to a separate section of the production shop (milk-producing cows). After this section is filled, in time P_r, a group begins to be formed in another section which is by this time free because cows have been taken from it and put in the shop for interlactation animals. The group formed is usually kept together until the end of the lactation period. It may be broken up before the end of the lactation period because the cows come into season at different times, have different lengths of the service period, and therefore steam up at different times.

In the second case, that is, when there is a shop for building up milk yield and insemination of the cows, it is advisable to form the production groups of cows in the same shop. In the shop for 100 days the milk yield

of the cows is built up and barren cows and cows with diminished productivity are culled. The production group is composed of cows which have been successfully inseminated during the calculated period. After 100 days this group is transferred to the milk herd shop, then all the animals of the group are steamed up at the same time, and later proceed in sequence to the interlactation shop, the calving division, and finally again to the shop for building up milk yield.

Experience shows that it is advisable to put first-time mothers in separate groups in a large complex or unit. This makes it possible with rigid culling for 5-6 years to form a herd that is more uniform in level of productivity and other economically useful characteristics.

Roughly the same steps are used to substantiate flow production at complexes which raise replacement cattle and raise and feed out young cattle not needed for replacement. These calculations make it possible to write up calendar plans and schedules for the arrival of calves at the complex and their movement from one shop to another until the time that they are identified as first-time mothers who have been tested for productivity and other characteristics or until they are taken off the fattening diet and sent to the meat combine.

Table 1 below gives an example of a calendar plan for the arrival of calves at a feed complex and their movement from one shop to another until they are taken off the fattening diet. This plan was written for a complex that raises and feeds out young animals from the age of 7-20 days until 14 months and has 5,760 places (1,440 in the growth shop and 4,320 in the feeding out shop). In conformity with the accepted procedure, calves are shipped in batches of 360 head every 26 days; shipping is done in two groups of 180 on two consecutive days. The early growth phase lasts 100 days: 65 days for the milk period and 35 days for the additional growth period. The period of intensive feeding lasts 300 days, after which the fattened stock are sold to a meat combine.

It is contemplated that each batch of calves that has arrived to be raised will be formed into two production groups of 180 head apiece. The animals in them should be similarly developed with an age difference of no more than 13 days; this permits keeping them in similar conditions on similar diets. The group formed upon arrival is not changed until the end of feeding out. Thus, if a group of calves arrives at the complex on 1-2 January, for example, on 6-7 March (65 days later) according to the accepted procedure all animals in this group should be transferred to the second phase of growth, and on 10-11 April put on a fattening diet. On 4-5 February of the next year they should be taken off the fattening diet.

Following the calendar plan a schedule of the arrival of calves at the complex and transfer of them from one shop to another with ultimate departure can be written up. Table 2 below gives as an example a part of a schedule of the arrival of calves for the growth phase, written in conformity with a calendar plan.

№ партии (a)	(b)			(c)			(d)			(e)		
	(f)	(g)	(h)	(f)	(g)	(h)	(f)	(g)	(h)	(f)	(g)	(h)
1	1—2	I	1980	6—7	III	1980	10—11	IV	1980	4—5	II	1981
2	27—28	I	1980	2—3	IV	1980	7—8	V	1980	2—3	III	1981
3	22—23	II	1980	27—28	IV	1980	1—2	VI	1980	28—29	III	1981
4	19—20	III	1980	23—24	V	1980	27—28	VI	1980	23—24	IV	1981
5	14—15	IV	1980	18—19	VI	1980	23—24	VII	1980	19—20	V	1981
6	10—11	V	1980	14—15	VII	1980	18—19	VIII	1980	14—15	VI	1981
7	5—6	VI	1980	9—10	VIII	1980	13—14	IX	1980	10—11	VII	1981
8	1—2	VII	1980	4—5	IX	1980	9—10	X	1980	7—6	VIII	1981
9	27—28	VII	1980	1—2	X	1980	5—6	XI	1980	1—2	IX	1981
10	23—24	VIII	1980	27—28	X	1980	1—2	XII	1980	27—28	IX	1981
11	18—19	IX	1980	22—23	XI	1980	27—28	XII	1980	2?—23	X	1981
12	14—15	X	1980	18—19	XII	1980	22—23	I	1981	18—19	XI	1981
13	9—10	XI	1980	13—14	I	1981	17—18	II	1981	14—15	XII	1981
14	5—6	XII	1980	8—9	II	1981	15—16	III	1981	9—10	I	1982

Table 1. Calendar Plan (not considering the movement of young animals who arrived in earl'er years) of Arrival, Movement, and Departure of Young Animals at a Feeding Out Complex.

Key: (a) Batch Number;
(b) Arrival of Groups of Calves at Growth Shop;
(c) Transfer to Second Phase of Growth;
(d) Transfer to Feeding Out Shop;
(e) Taking Animals Off Fattening Diet;
(f) Number;
(g) Month;
(h) Year.

Calendar plans and schedules of arrival and movement of animals for the entire planning year are made up in a similar fashion. It is taken into account here that in conformity with established times for raising and feeding out in January 1980, for example, animals which arrive at the complex in December 1978 must be taken off fattening, and so on. The availability of such calendar plans and schedules makes it possible to exercise operational control over the course of production and is the basis for compiling monthly and annual herd cycles and plans for production of output.

Year-round rhythmic production at industrial-type animal husbandry complexes and units insures more effective use of production buildings, various machinery, and other means of production. It enables the complex to establish a consistent work regime that repeats each month and is carried out by the

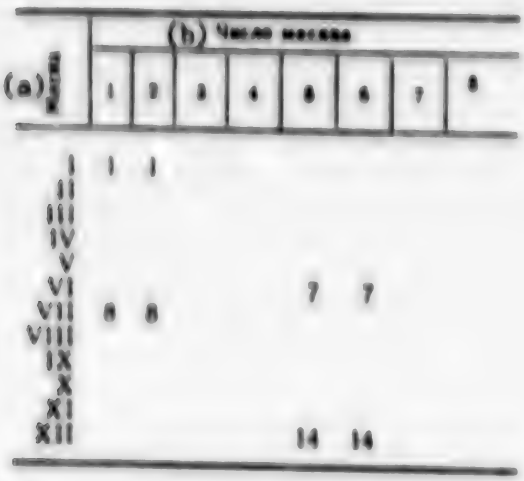

Table 2. Schedule of the Arrival of Batches of Calves at the Complex for Raising During This Planning Year (Fragment).

Key: (a) Month;
(b) Number of Months.

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same service personnel, with the same herd size, amount of feed, and volume of output produced. Moreover, organizing flow production with a strictly observed rhythm makes it possible to plan more accurately and analyze the course of production more objectively.

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Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVO in Russian No 1, Jan 81 pp 15-23

[Article by Ivan Petrovich Bystryukov, deputy USSR Minister of Agriculture: "Construction Problems in the Countryside"]

[Text] Implementation of the long-term comprehensive program worked out by the party for continued development of the country's agriculture demanded allout strengthening of the material-technical base of agriculture, multifaceted improvements of the technology of agricultural production, broad introduction of up-to-date means of mechanizing production processes, chemicalization and land improvement, and a gradual transfer of the sector to an industrial basis.

To accomplish these purposes, capital investment in agriculture was increased significantly after the March 1965 Plenum of the CPSU Central Committee. Capital investment in the Ninth Five-Year Plan was 3.6 times greater than in the Seventh Five-Year Plan.

The overfulfillment of the plan for the 10th Five-Year Plan for state capital investment is 2.3 billion rubles, and for the kolkhozes it is 3.2 billion rubles.

The assignments of the 10th Five-Year Plan for the launching of poultry factories, buildings to house all types of productive livestock and poultry, seed grain storage facilities, vegetable and potato storage areas, silage structures, feed shops for animal husbandry, shops to produce mixed feeds, and certain other types of projects were fulfilled and overfulfilled.

All this permitted a substantial updating of the available basic production buildings and structures at the sovkhozes and kolkhozes. More than 75 percent of the buildings in use for housing cattle at the end of 1980 had been built since 1965. In hog raising the percentage of such structures was 90 percent, while in sheep raising it was more than 90 percent. About 75 percent of all vegetable and potato storage facilities and 85 percent of fruit storage structures have been built since 1965. During the same time a large amount of housing has been put into use and the network of children's preschool institutions and general educational schools has more than doubled. Many clubs and libraries have been built, the trade system has been significantly enlarged and updated, and medical and domestic services to the rural population have improved.

Nonetheless, work on many construction plans at enterprises of the USSR Ministry of Agriculture was not done fully: state animal husbandry complexes — 50-65 percent; hothouse combines — 50 percent; fruit storage facilities — 50 percent; storage structures for mineral fertilizer — 49 percent; children's preschool institutions — 74 percent; general educational schools — 84 percent; residential

buildings — 90 percent. But overall the plan for introduction of fixed capital was 95 percent fulfilled.

It should be emphasized especially that the amount of capital appropriated for nonproduction construction is extremely inadequate. But even this capital is not incorporated, year after year. While the USSR Ministry of Agriculture as a whole regularly fulfills its plans for production construction, the plans for construction of nonproduction projects are 96-97 percent fulfilled based on capital investment and 89-92 percent based on introduction of fixed capital. For this reason alone the workers at the sovkhozes in the 10th Five-Year Plan did not receive residential housing with a total area of 3.95 million square meters (eight percent of the plan), children's preschool institutions for 93,500 children (21 percent of the plan), and general educational schools for 133,000 (13 percent of the plan). Assignments for the construction of municipal projects are performed in an extremely unsatisfactory manner year after year.

Unsatisfactory performance of the plan for introducing various important production capacities and cultural-domestic projects is related to the fact that agricultural bodies, as clients, do not always solve the problems of supplying construction sites with technical documentation and equipment at the right time. USSR Gossnab, USSR Goskomsel'khoztekhnika, the Ministry of Machine Building for Animal Husbandry and Feed Production, and other supplier-ministries still do not supply agricultural construction sites with all the equipment, instruments, and other articles they need.

But the main causes of underfulfillment of plans are failures by contracting construction ministries, violation of contract obligations by them, failure to supply construction elements and materials, machinery and labor to rural projects, and poor organization of work at the construction site.

The USSR Ministry of Rural Construction is the principal contracting organization in the countryside. In all the years of its existence it has never fulfilled construction plans for agriculture. Year after year the USSR Ministry of Construction, USSR Ministry of Industrial Construction, and USSR Ministry of Power and Electrification do not fulfill their plans of contracting work for agriculture.

This situation forces sovkhozes and other agricultural enterprises and organizations to do a great deal of construction in-house, without the production-technical base necessary for this.

It should be noted that the overfulfillment of plans for capital investment and construction-installation in the Ninth and 10th Five-Year plans was accomplished by increasing in-house construction.

Less than two-thirds of the volume of capital construction at sovkhozes and other enterprises of the USSR Ministry of Agriculture is done by the contract method. Moreover, in recent years the proportion of construction by contract has not grown at all; it has actually declined from 65 percent in 1975 to 62 percent in 1979. For certain Union republics the proportion of contract method construction is even lower. It is 49 percent in the Kazakh SSR and 59 percent in the RSFSR, which includes 52 percent in Bryanskaya Oblast, 50 percent in Smolenskaya Oblast, 53 percent in Sverdlovskaya Oblast, and 46 percent in Saratovskaya Oblast.

At the same time, performing large volumes of capital construction in-house demands great effort on the part of the managers of enterprises and agricultural bodies. This distracts them from their primary activities related to organizing the production of agricultural output. In addition, the in-house method is often

used not to build what is most needed, but rather what can be built with available resources.

The in-house method is especially widespread in housing construction. At enterprises and organizations of the RSFSR Ministry of Agriculture, for example, the proportion is 40 percent, and this includes 63 percent in the Nonchernozem zone.

What has been said above leads directly to the conclusion that there must be a sharp increase in the proportion of the contract method of construction at enterprises and organizations of the USSR Ministry of Agriculture. It must be raised to 80-85 percent as a minimum by 1985.

We should note that the proportion of contract construction in other sectors of the economy is already 95 percent today.

To handle the growing volume of construction in the countryside we must enlist the organizations of all the construction and other ministries and departments more broadly in this work, build up the capacities of these contracting organizations by every means and — most importantly — increase the role and accountability of the USSR Ministry of Rural Construction for building up the countryside.

The USSR Ministry of Rural Construction has not increased the volume of construction at sovkhozes and other state enterprises of the system of the USSR Ministry of Agriculture since 1976. Its share in this construction in 1979 was just 27 percent, compared to 30 percent in 1975.

Work for the agricultural complex (including the USSR Ministry of Procurements and its own construction) makes up about 70 percent of the program of the USSR Ministry of Rural Construction. The rest of the work is orders from local Soviets, projects for processing industry, and the like.

The level of plan fulfillment of work for the agricultural complex is consistently lower than the level of performance for other customers. The assignment set by the July 1970 Plenum of the CPSU Central Committee, which said that by 1975 organizations of the USSR Ministry of Rural Construction should be doing at least 5.5 billion rubles of construction and installation work in the countryside each year, remains unfulfilled to this day. The established practice of assigning work to organizations of this ministry on the territorial principles results in a situation where it is still assigned to build projects which are not within its specialization at the expense of agricultural construction. In Moldavia, for example, organizations of the ministry are building a carpet combine, a sugar plant, and wineries.

In our opinion, the USSR Ministry of Rural Construction must have a larger part in agricultural construction. To achieve this it must be liberated from the work of building any projects not within its specialization so that it can concentrate all the capacities of its construction-installation organizations in rural construction. At the same time, the capacities of the ministry should be rapidly built up so that its organizations will be able to do at least 7.5 billion rubles worth of construction-installation work in the countryside in 1985.

To bring the USSR Ministry of Rural Construction closer to the interests of agriculture and coordinate its work more closely with the activities of agricultural agencies, it would be advisable to include this ministry in the agricultural sector of the economy, and plan and support its activities through the agricultural division of USSR Gosplan.

The interests of the work demand that this ministry be considered an organic, constituent part of the agrarian-industrial food complex which, as Comrade L. I. Brezhnev stated at the November 1980 Plenum of the CPSU Central Committee, should be planned, financed, and managed as a single integrated unit with a focus on final results.

The strength and vitality of a rural construction organization is inseparably linked to the agricultural enterprises for which it builds. If the contracting organization is in close touch with the interest of the farm and region, it will always receive help in the form of personnel and equipment.

In this respect, the subdivisions of the interkolkhoz construction organizations show greater flexibility; they have come to "belong" in the rayon and the oblast.

Successful development of interkolkhoz construction organizations became possible because the kolkhozes, who participate in them, are constantly assisting them with labor and transportation. As a rule, kolkhozes, even those in difficult financial situations, allow interkolkhoz construction organizations to keep their own profit for further development.

Capital investment in the development of interkolkhoz construction organizations now exceeds 1 billion rubles a year. As a result, large contracting organizations have grown up in the countryside. At the start of 1980 there were 2,800 primary kolkhoz construction organizations and they employed more than 1 million persons, including more than 130,000 engineers and technicians. They are served by 67 large planning institutes and 69 branches of these institutes, 37 teaching combines, and a large number of construction industry enterprises that produce materials, parts, and design elements with a total value of about 2 billion rubles.

At the same time, there are serious shortcomings in the work of the interkolkhoz construction organizations and they have a negative effect on fulfillment of capital construction plans at the kolkhozes. A trend has appeared recently to divorce interkolkhoz construction organizations from the participating kolkhozes and neglect the interests of the kolkhozes. At the present time a large share of the capital of the interkolkhoz construction organizations, which is used for capital investment and increasing the norm of working capital (including repayment of USSR Gosbank loans), is not credited to the participating kolkhozes in the share contribution.

The different republics have established different procedures for coordinating and ratifying the plan of contract work by interkolkhoz construction organizations. The participating farms are to some degree cut off from the formation of their plans for contract work. As a result, the plans include increasing amounts of work for nonagricultural organizations. Certain planning agencies have come to consider interkolkhoz construction organizations as ordinary contractors.

Under the pretext of eliminating parallelism in the work of state and kolkhoz rural construction organizations, the interkolkhoz construction organizations in Georgia, Tajikistan, and Turkmenistan have been taken into the republic ministries of rural construction in recent years, instead of coordinating their work and development of their production base according to a unified plan, which is what the decree of the CPSU Central Committee and USSR Council of Ministers envisioned. The Uzkolkhozstroy [Uzbek Kolkhoz Construction] State-Cooperative Association has been formed in Uzbekistan on the basis of the interkolkhoz construction organizations.

It is possible that consolidating the production bases of the state and interkolkhoz construction organizations will make it possible to improve the work and work indicators of the builders. But we do not need construction for the sake of construction. We need it for the final goal, increasing the production of agricultural output.

In this respect, the kolkhozes which have their own construction organizations and influence their work directly through the kolkhoz councils, can solve problems more rapidly and flexibly.

Like any interkolkhoz formations, the interkolkhoz construction organizations are subordinate to the kolkhoz councils of the republics, oblasts, and rayons, which should exercise greater influence on shaping the plan of contracting work of the interkolkhoz construction organization and improving the use of the capacities of industrial enterprises.

The interkolkhoz organizations of the country today use capacities for the production of reinforced prefabricated concrete articles at the 70-75 percent level, while for brick it is 60-70 percent, and for light aggregate — 50 percent. On 1 January 1980 the interkolkhoz construction organizations, which are the property of the kolkhozes, had fixed capital of 8,711,500,000 rubles, 44.1 percent of which was long-term bank credit. Needless to say, these capacities of the interkolkhoz construction organizations should be fully directed, above all, to meeting the needs of the kolkhozes. The first order of business is to achieve a significant cutback in in-house construction.

The initiative of Ukrmezhkolkhozstroy [Ukrainian Interkolkhoz Construction] deserves all possible support. This organization decided to contract for all construction work at kolkhozes of the republic, and thus retired the in-house method. This is not an easy challenge. It requires solving a whole set of problems related to improving planning, the organization of management, and supply to construction at the kolkhozes. All this requires time. Perhaps they will not be able to completely eliminate the in-house method. It would seem that this is not even wise. But the fact that the association, a specialized organization, will not only be responsible for all construction at kolkhozes but will also organize the work is very important.

In some rayons, oblasts, and republics it becomes necessary to call on the interkolkhoz construction organizations for work at sovkhozes and other state agricultural organizations. In 1979 they did 970 million rubles worth of this work, which was 18 percent of the work done by interkolkhoz construction organizations in the country. But this should not become a regular practice.

Given the constant shortage of labor at contracting construction organizations, which will only become worse in the future, there is just one way that they can perform a growing volume of construction-installation work: a significant rise in labor productivity. This can be accomplished by further industrialization of construction and increasing the level of prefabrication of production, residential, and cultural-domestic buildings and structures. The process of construction must be transferred, as much as possible, from the construction site to the plants, rural construction combines which not only manufacture prefabricated buildings with a high level of factory readiness and built-in utilities, but also install them at the construction site and turn over finished buildings to the customer.

At the present time, given the shortage of capacities of contracting construction organizations, there is nothing else for us to do but build up the in-house

construction subdivision and sovkhozes, and also on the rayon and oblast level, particularly those that are building housing. No matter how paradoxical it may seem, we must establish and strengthen their production base and work to increase the allocation of materials, equipment, and construction machines to organize the production of reinforced concrete, carpentry pieces, and the like.

Under these conditions it becomes especially important to organize the production base for development, preparation, and use of local building materials and articles made from them, beginning from the construction of brick plants (including seasonal plants), shops to produce gypsum blocks and divider slabs, manufacture of wall blocks from natural stone and various adhesive substances, mining and roasting lime, and setting up quarries to produce sand, gravel, crushed rock, clay, and the like.

Organizing in-house logging, timber hauling, and wood processing (milling, drying, and manufacturing parts and elements from it) is an important question.

The organization of construction by the in-house method at kolkhozes and sovkhozes in Novosibirskaya Oblast may serve as an example. In the first four years of the 10th Five-Year Plan these kolkhozes and sovkhozes incorporated 552.4 million rubles of construction-installation work by the in-house method against a plan of 188 million rubles. The volume of construction-installation work done by the in-house method in 1979 was 60 percent of the total volume done in the oblast.

The production administration of agriculture of the oblast executive committee organized the Stroydetal' [Construction Element] Trust to insure fulfillment of the capital construction plan. This trust operates eight enterprises with an annual production volume of 18.7 million bricks, 108 000 cubic meters of crushed rock, 40,000 cubic meters of sand, 148,000 cubic meters of timber, and 63,000 cubic meters of lumber. Most of these materials are delivered directly to the farms by centralized hauling.

A significant amount of the timber is logged by interkolkhoz-sovkhoz logging enterprises. Many of them have organized the production of flooring and carpentry articles. The seasonal brick plants of the kolkhozes and sovkhozes produce almost 35 million bricks a year. The Sel'khozenergo [Agricultural Energy] Production Enterprise has organized the production of cable, fittings, and lights. Most of the kolkhozes and sovkhozes have permanent construction sections and shops.

The industrial enterprises of Novosibirsk and other cities of the oblast are extensively involved in building agricultural projects such as feed shops, silage trenches, and livestock quarters.

Novosibirskaya Oblast has developed the method of "zonal alignment of plans" to solve the problem of providing construction sites with planning and estimate documents for simple production and nonproduction facilities, especially when they are being built with Gosbank loans. This method was reviewed and approved by RSFSR Gosstroy and the RSFSR Ministry of Agriculture. It makes it possible to align plans very quickly and well, while at the same time saving significant capital for planning and surveying work.

The in-house method of construction makes possible to use the work force of a farm during the off-season for agricultural work, which increases the level of employment and incomes of kolkhoz members and sovkhoz workers. Moreover, and this is even more important, in-house construction can be carried on without

taking people away from their families and customary living conditions. This is a great advantage over the working and living conditions of the workers of the mobile construction columns of contracting organizations.

In a number of cases the "mixed" method of construction is even more promising. A contracting organization often has surplus capacities or capacities which are partially unused for various reasons within its construction base and can manufacture more industrial-type construction designs and parts for the sovkhoz or kolkhoz using raw materials which they provide. But the more preferable situation is where the contracting organization manufactures and installs the basic design elements of buildings under contract using its own personnel, and the farm workers complete the construction and finishing work.

While discussing these reserves of rural construction which have not yet been used to the full but have become accepted in many places, I would like to direct the attention of planning agencies and construction and agricultural organizations to them so that they will take this supplementary resource into account in calculations and plans for stepping up reorganization of the countryside.

One of the serious problems of agricultural construction is the necessity of increasing the production of efficient lightened design elements and materials for rural construction by every means. The contracting organizations of the construction and other ministries, with the exception of the Ministry of Rural Construction, today perform 35 percent of the entire program of construction and installation work for the enterprises and organizations of the USSR Ministry of Agriculture system. They are not really working to develop the production of lightened design elements and compel the use of heavy industrial articles for rural production buildings. This raises the cost of construction and leads to excess use of metal, cement, and other resources.

In recent years, for a number of reasons, prefabricated reinforced concrete design elements have been the principal bearing and dividing units in rural construction throughout the country. Comrade L. I. Brezhnev spoke of the large number of them and their excessive weight in rural projects in his talk at the July 1978 Plenum of the CPSU Central Committee. Unfortunately, we will not be able to get away from the use of reinforced concrete elements for some time. But it is urgent for us to demand that they be lightened with respect to the assortment for rural construction. This is being done by the USSR Ministry of Rural Construction, Glavmosoblstroy [Main Administration for Construction in Moscow Oblast], and a number of other organizations.

The basic materials used in the production of reinforced concrete design elements and of concrete in general are local materials, which gives them relatively low cost. A cubic meter of finished prefabricated elements is cheaper than a cubic meter of standard lumber. The use of reinforced concrete designs provides well-built, durable buildings even under the most demanding operating conditions.

Some work has been done in the country in recent years to develop efficient lightened elements and materials for rural construction. Unfortunately, however, production is on a low level.

The wall and ceiling elements using asbestos cement sheets on a wooden frame were widely employed, but did not work out as well as expected: the operating qualities of the buildings were worse, durability and fire resistance were diminished, and they did not lower the cost of construction. Buildings built using glued wood elements proved more expensive, and their sphere of application is also limited.

Practically no lightened metal elements (including aluminum elements) are allocated for rural construction, even though experience with their use in building the first livestock complexes and poultry factories demonstrated that they are highly efficient. At the same time, these elements are used widely in construction of light, food, and meat-dairy industry enterprises in rural areas. There can hardly be any good reason for this situation.

Unfortunately, our industry is not producing articles and materials made of plastic for rural construction. Polymer materials for rural construction are produced in the country, but at the present time this is only done at the Ukrainian Ministry of Agriculture whose experimental design bureau and Stroyplastik [Construction Plastic] experimental production facility has been in operation for many years. They have already built more than 100 livestock, poultry, and other buildings with extensive use of plastic. Unfortunately, because of the problem of supplying raw materials, this initiative is developing slowly.

Directive agencies commissioned a number of ministries and departments that perform construction in the rural areas to organize the production of lightened reinforced concrete and other economical design elements in order to fully eliminate the use of industrial building parts in rural projects in 1981. This is a very important assignment and must be performed on time. According to our information, the ministries are going slowly on this problem; they continue to insist on the use of industrial design elements and payment for the cost of them.

The July 1978 Plenum of the CPSU Central Committee presented major criticism of agricultural and construction organizations for the fact that the estimated cost of construction of agricultural projects had risen sharply in the last 10-13 years.

The USSR Ministry of Agriculture and republic and local agricultural agencies are taking steps to lower the estimated cost of construction and raise the efficiency of capital investment in agriculture. Among these steps are improving the norms for technological designing, improving the economy features of the design concepts of agricultural projects, and correctly combining new construction with reconstruction and modernization of existing facilities, above all at the livestock units, of the sovkhozes and kolkhozes. A great deal has been done to eliminate the dispersion of capital over too many sites and projects, to reduce the level of incomplete construction to the norm, to raise the accountability of agricultural agencies and the managers of enterprises, organizations, and construction sites for purposeful use of allocated capital, and to exercise strict control over the progress of construction at key projects and their launching into operation at the assigned time.

Nonetheless, these measures have proved inadequate. There are objective reasons for this, of course, but there are also factors on which we can exercise a substantial influence.

What are the factors that cause the increase in the cost of construction?

Roughly 35 percent of the growth in construction costs is linked to the use of modern progressive technologies, improvement in working conditions, raising the level of mechanization and automation, insuring comprehensive construction of primary production projects and essential subsidiary and sanitary-domestic facilities, utility systems, and other structures, measures to protect the environment, and the improved quality of buildings.

Another part of the increase in cost, approximately 30 percent, is the result of the new higher estimated norms and prices for construction materials and design elements introduced in 1969, the increase in wages of construction workers, the increase in the norms of planned savings for construction organizations, the introduction of new transportation systems, and the like.

About 20 percent of the rise in cost can be explained by the growing proportion of the contract method of construction, the rise in the level of industrialization, prefabrication, and standardization of design and space-planning concepts, and the introduction of higher payments for the mobile character of work when methods of production change. The remainder is made up of expenditures associated with the growing complexity of conditions in which agricultural projects are located (more lines of communication outside the construction site and allocation of land that requires additional expenditures for development).

An analysis of the above-enumerated factors that have brought about the increase in construction cost shows that there are definite reserves for lowering the cost, and that the efforts of agricultural agencies should be directed to using them.

Above all, we must improve normative documents, standard designs, and their design, technological, and space-planning concepts and prepare high-quality technical-economic substantiation of the necessity of building a particular project, selecting the design and construction site for it, and reducing communications lines.

Whereas significant changes have been noted in the sphere of production activity in recent years and a clearly marked trend is seen toward smoothing out the differences in working conditions between the city and the countryside, in the sphere of housing and cultural-domestic conditions the difference is much greater.

All this re-emphasizes the critical need to solve the multifaceted problem of reorganization of the countryside as one of the decisive factors in the continued rise of agriculture.

Naturally, many questions arise on the way to solving this important nationwide problem: what will the rural community be like; what will the rural home be like; what means should be used to solve the problem of reorganization of the countryside, based on realistic possibilities, and in what way?

It is obvious that no solutions to the questions will be found without a thoroughly scientific approach. In a number of cases clear miscalculations were made on precisely these problems and things were not worked through fully. Among these shortcomings were incorrect choices of the best type of construction, too much haste in eliminating and abandoning small, so-called unpromising rural communities, and mistakes in the development of regional plans. The weakness of scientific research in this area and of the recommendations based on this research is one of the principal reasons for existing shortcomings in questions of rural construction.

Attempts in the recent past to substantiate these processes by developing plans for rural rayons with schemes for the pattern of rural settlement and a determination of promising and unpromising settlements that was rather poorly coordinated with the development of agricultural production and industry were not successful. Most of these plans were filed away, and never saw the light of day.

It is common knowledge that high-rise residential construction received fairly widespread distribution owing to a number of factors, foremost among which are the economy with respect to estimated cost of construction and material resources, the demands of contracting construction organizations working with the capabilities of an urban construction base, and misguided borrowing of urban ways of life. This type of construction practically precluded private plots and outbuildings for running private farming operations. It led to significant disputes, but nonetheless it spread and, to some degree, had an effect on separating some rural workers from the land, changing them from producers to consumers of agricultural output.

Fortunately, common sense prevailed. The July 1978 Plenum of the CPSU Central Committee put an end to the disputes. Comrade L. I. Brezhnev stated clearly that agricultural construction should orient itself in most cases to providing families with well-appointed detached buildings with private farming plots and outbuildings.

In conformity with the long-term program of development outlined by the party, the process of concentration of agricultural production is now going forward through reconstruction and expansion of existing enterprises to produce agricultural output, chiefly livestock and poultry output, and construction of new enterprises. Agroindustrial complexes are being formed, including enterprises of the mixed feed industry, agricultural processing industry, agrochemical centers, hothouse combines, Goskomsel'khoztekhnika enterprises, and the like. Scientific research and planning organizations must study these processes carefully in order to take fuller account of their consequences and impact in working out plans for administrative regions, the formation of rural industrial centers and development of residential communities near them, and in drawing up plans for the layout and construction of communities.

It would be incorrect, however, not to mention the problems which arise with the new approach to rural construction. The main thing we have in mind is the need to find significant material resources and capital investment for the construction of extended, intricate utilities systems and good street systems, the significant rise in the cost of construction, and the limited capacities of the contracting construction organizations.

Under these conditions it is very important to enlist the capital of the rural population to develop individual and cooperative construction. On 19 July 1978 the CPSU Central Committee and USSR Council of Ministers adopted a decree on this subject entitled "Further Development of the Construction of Individual Housing and Keeping Workers in the Countryside." This decree envisioned steps to stimulate individual housing construction by preferential long-term credit. Unfortunately, the decree has received little publicity and practically no one knows about it in the local areas.

This is confirmed by reports from the ministries of agriculture of several Union republics on the contemplated volume of this type of housing construction. For example, according to figures of the Kazakh SSR Ministry of Agriculture, just 372 sovkhoz workers expressed a desire to receive individual housing under the new conditions in 1980. This is one person per five sovkhozes! If broad explanatory work had been organized, the number of agricultural workers wishing to build individual homes would have been [illegible] larger.

There is another limiting factor. At the present time the necessary material resources for this construction are not supplied. It was chiefly for this reason

that the volume of individual housing construction in the countryside dropped from 20.7 million square meters of total housing space in 1970 to 11.7 million square meters in 1979.

Individual homes may be successfully built through the efforts of the builders themselves, the future residents. But to do this they must receive the necessary materials, finished articles, and sanitary engineering equipment. There are great hopes in this area for the development of wood-panel home-building and delivering sets of wooden parts for homes built with walls of local building material.

It is regrettable to have to state that many of the problems in rural construction arise from poor communication and inadequate contacts between planners and architects and the agricultural agencies of the rayons, oblasts, and republics. The latter, incidentally, must share a certain part of the responsibility. It is also impossible to overlook a certain lack of coordination in the activities of the departments who are directly involved in the problems of reconstruction of the countryside. It is true that an effort was made recently to coordinate their activities in relation to building in the countryside. The USSR Ministry of Agriculture, USSR Gosgrazhdanstroy [Main Administration for Civil Engineering Construction], the USSR Ministry of Rural Construction, and the USSR Union of Architects issued a joint order which ratified the elaborate measures and joint actions to carry them out. The job now is to see that each performer makes the maximum effort to carry out these measures.

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VASKhNIL SCIENTISTS REVIEW THEIR ROLE IN AGRICULTURAL DEVELOPMENT

Moscow SEL'SKAYA ZHIZN' in Russian 17 Apr 81 p 2

[Article by I. Gorlanov: "In the Interests of Production"]

[Text] One of the basic tasks assigned by the 26th party congress for the 11th Five-Year Plan and for the 1980's on the whole is that of converting the economy over to intensive development and raising the efficiency of social production based upon an acceleration in scientific-technical progress. The congress emphasized the fact that scientific and engineering development must be subordinated to an even greater degree to the successful solving of the economic and social tasks of our Soviet society. The tasks associated with the development of the country's agroindustrial complex and its most important sphere -- agriculture -- are especially important and large-scale in nature. Science must play a great role in carrying out the various plans.

The tasks of the agricultural science in light of the decisions handed down during the 26th CPSU Congress were thoroughly discussed in a business-like manner during a scientific session of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V.I. Lenin] held on 13 and 14 April. Eminent scientists of VASKhNIL, the USSR Academy of Sciences, the academies of sciences of union republics, scientific institutes and educational institutes of branches of the agroindustrial complex participated in the work of this session.

In the report delivered by the President of VASKhNIL P.P. Vavilov and in the speeches by other scientists, it was mentioned that the far-flung network of institutes, experimental stations and higher educational institutes is carrying out a tremendous volume of studies on improving the techniques, technology and organization of agricultural production and raising the intensity of farming and animal husbandry. However, in light of the new tasks assigned by the party to scientists working in the sphere of agriculture and its associated branches of the agroindustrial complex, more complicated and important problems are arising which are imposing raised requirements upon the scientists. We are speaking mainly about the need for achieving stable growth in the production of farming and animal husbandry products.

Control Over Fertility

Considerable importance is attached to the development and implementation of the food program. "It must," stated Comrade L.I. Brezhnev during the 26th CPSU Congress, ensure a considerable increase in the production of agricultural products. It must

draw agriculture closer to those branches engaged in the storage and processing of its products. And certainly to trade. In other words, its goal is to solve as rapidly as possible the task of providing the population with a continuous supply of products."

In this regard, it was stated during the session that the collectives of institutes, VUZ's and experimental stations must intensify their studies aimed at finding more effective means for utilizing the natural, biological, technical, economic, organizational and social factors, required for the further intensification of the production of farming and animal husbandry products and for raising the efficiency of agriculture and other branches of the agroindustrial complex. In order to solve these tasks, the scientific, planning-design and experimental institutes must convert over to carrying out practical work based upon all-round special purpose programs. At the present time, as mentioned by a speaker, a number of inter-departmental and departmental special purpose programs concerned with very important agricultural problems have already been developed and approved.

The VASKhNIL scientists have devoted a great amount of attention to the problems concerned with raising the fertility of soils and the overall culture of farming and to ensuring scientifically sound land reclamation operations and the use of chemical processes in production, without which it would be impossible to obtain high and stable yields or achieve the goals established for the five-year period. Academician Ye.N. Mishustin, VASKhNIL academicians T.N. Kulakovskaya and I.S. Shatilov, Corresponding Member of VASKhNIL V.G. Mineyev and other scientists raised these problems in their speeches.

In recent years the scientific institutes have begun to develop and employ, in a more active manner, various methods for combating wind and water erosion of soils, which causes great damage to farming. In particular, as reported by VASKhNIL Academician A.I. Barayev, the soil-protective system of farming developed by scientists at the All-Union Scientific Research Institute of the Grain Economy is now being employed in the steppe regions of Kazakhstan, Sibiria, the southern Urals, Volga region, the north Caucasus and in a number of oblasts in the Ukraine, on an area of 39.7 million hectares. A soil-protective and moisture-retaining system for farming on slopes, developed by the Altay Scientific Research Institute of Farming and Plant Breeding, is producing fine results.

The scientists have focused attention on the fact that the use of chemical agents in farming, particularly fertilizers, produces good results only in those instances when the production technology for a particular product is developed and employed while taking into account all of the principal factors: soil fertility, peculiarities of climate and weather, land reclamation and agrotechnical measures carried out, characteristics of varieties and so forth.

The scientists also discussed the need for developing scientifically sound methods for distributing fertilizers and other logistical resources and in keeping with the final goal -- obtaining maximum yields while protecting soil fertility and preventing environmental pollution.

It was mentioned during the session that noticeable and positive achievements have been realized in recent years in plant breeding work, especially in the eastern

regions of the country. Definite successes have been achieved in the breeding of winter and spring wheat, winter rye, barley, peas, cotton and other crops. At the same time, the scientists discussed the need for the further development and intensification of the plant breeding process and raising its effectiveness. As yet, not all of the plant breeding centers are operating at maximum capability. For example, of the overall area on which winter wheat is sown, approximately 82 percent is occupied by varieties created at the Mironovka, Krasnodar, Odessa and Rostov plant breeding centers, while varieties of the remaining 47 plant breeding centers occupy only 18 percent. The situation is the same for a number of other crops.

Very serious shortcomings exist today in connection with the breeding of corn and sunflowers. The varieties and hybrids of these crops presently being employed in production are characterized by extended growing seasons and this tends to delay the harvesting schedules and thus causes great losses in the crop. A considerable portion of the corn plantings grown for grain are being cut down for silage. It was mentioned that the All-Union Scientific Research Institute of Corn, the leading institute for working out problems in this field, is only slowly organizing its operations. Moreover, a large portion of its workers are concerning themselves with problems that are not associated with corn. As reported by one speaker, the Presidium of VASKhNIL and the USSR Ministry of Agriculture have developed long range programs for the breeding of corn and they have created several creative groups for seeing that they are carried out.

During the session, VASKhNIL academicians G.S. Galeyev, P.L. Goncharov, S.Kh. Suldashev and P.I. Al'smik and corresponding members of VASKhNIL V.P. Dorofeyev, M.P. Aleshin and doctors of agricultural sciences L.K. Sechnyak and N.M. Chekalin discussed methods for further improving the plant breeding and seed production for agricultural crops.

Displaying special concern, the scientists discussed the fact that, owing to the inefficient organization of seed production work for a number of crops, many valuable varieties and hybrids, even despite the fact that they are regionalized, are not being given proper attention out on the fields. Thus one of the most important sectors of work in the field of crop husbandry today is that of improving seed production work at all levels and achieving rapid propagation of those varieties and hybrids which have proven their worth in a positive manner.

The scientists discussed with great interest those problems concerned with the development and introduction of industrial technologies for the cultivation of the principal agricultural crops. In particular, a requirement was expressed for changing the organization of research work. Actually, only individual technological aspects are being developed at the present time at many institutes, aspects which are not being coordinated one with the other and, as a result, the recommendations of the scientists are not being employed extensively. The task consists of ensuring that the developments are worked out to completeness and that specialists from the various fields of knowledge participate in the work -- farmers, crop husbandrymen, machine operators, phytopathologists, entomologists and economists.

It was mentioned during the session that the task of achieving stable yields of grain and other crop husbandry products will be associated to a greater degree with the development and introduction into operations of methods for the programming of

yields. A coordination council for the programming of yields, attached to the VASKhNIL Presidium, is engaged at the present time in developing appropriate methods and recommendations.

In light of the new tasks assigned by the 26th CPSU Congress, the need for expanding and intensifying studies associated with the development of animal husbandry has increased even more. The party has established the fact that today animal husbandry is a vital front of work in the rural areas.

Main Sector of Work

Beyond any doubt, the country's scientists have made a considerable contribution towards developing the vital problems associated with the intensification of this branch. But considerably more is required of science today. First of all, the kolkhozes and sovkhozes require basic developments associated with solving the feed problem and raising the efficiency of feed production. The scientists noted that the unsatisfactory status of the feed base, especially from a quality standpoint, is today the limiting factor in the development of animal husbandry. Feed losses are still very great (both quantitatively and qualitatively) during procurement and storage operations. The following data was cited during the session: on the average, for a period of 3 years, almost one third of the hay procured at kolkhozes and sovkhozes turned out to be of low quality.

The data from the following experiment underscores how productivity is affected by the quality of the feed: three groups of cows were fed the same amount of concentrates (3.5 kilograms) and silage of varying quality. The cows which were fed silage of 1st class quality furnished 16.2 kilograms of milk daily; the cows which were fed silage of 2d class quality -- only 8 kilograms each and from cows which were fed low grade silage, together with the same 3.5 kilograms of concentrates -- only 3.5 kilograms of milk each.

The chief cause of low quality feed procurements -- violations of the technology recommended by the scientists. Meanwhile, merely by raising the quality of the hay, haylage, silage and grass meal and also by eliminating losses caused by feed spoilage, animal husbandry can be supplied with approximately 40-50 million additional tons of feed units. And this is almost one third of the overall amount being produced at the present time. Thus the question concerned with the rapid creation of a developed feed industry and the construction of modern feed storehouses aroused special interest during the session. Mention was also made of the need for utilizing more rapidly and more completely the growing potential for increasing the production of plant protein, by expanding and improving the cultivation of crops rich in protein, crops such as alfalfa, clover, soybeans, peas, vetch, lupine, rape and others. Importance is also attached to improving the haying and pasture lands on a more extensive scale and in a high quality manner.

For the intensification of animal husbandry, exceptional importance is attached to work concerned with improving existing and creating new and highly productive strains and pedigree groups, lines and hybrids of livestock and poultry suitable for industrial technologies. It was mentioned during the session that by no means have the agricultural livestock existing in the country at the present time exhausted their potential. But modern animal husbandry requires livestock strains and types

which will return better reimbursement for feed in the form of products. Thus a reduction of just one percent in specific feed consumption makes it possible to realize a savings throughout the country of approximately 5 million tons of feed units and to obtain, as a result of this, approximately 4 million additional tons of milk.

Those participating in the session also devoted a great amount of attention to those problems associated with the development and introduction of entire technologies for the production of milk, meat and other farm products, the equipment used for mechanizing the labor of livestock breeders and feed procurement specialists, reliable methods for combating diseases in livestock and poultry, reducing the losses caused by barrenness and mastitis in cows and achieving expanded reproduction of a productive herd. Corresponding members of VASKhNIL K.U. Medeubekov and V.S. Shipilov, the Deputy Minister of Machine Building for Animal Husbandry and Feed Production V.N. Tkachev and others devoted their speeches to these matters.

Those scientists working in the sphere of production mechanization and electrification bear a great amount of responsibility for the rates of technical progress in agriculture and other branches of the agroindustrial complex. Despite the well known successes achieved in this work, as mentioned during the session, many bottlenecks and unresolved problems still remain. Taking into account the diverse nature of the natural-climatic conditions found in the different zones, as mentioned by VASKhNIL Academician M.S. Runchev and the Director of the Raduga All-Union Scientific Production Association in their speeches, it can be stated that modern-day agriculture requires more improved and highly productive machines and implements for the cultivation and flow-line harvesting of crops and for the post harvest processing of grain, potatoes, vegetables and forage crops, including those grown under irrigation conditions.

This must not be individual or separate technical means, but rather a complete complex of mechanisms and implements which will make it possible to employ industrial technologies out on the fields. A requirement also exists here for all-round special purpose programs, the realization of which would involve the participation of scientists, designers and machine builders from organizations and enterprises of all branches of the agroindustrial complex. The special purpose programs must call for strict responsibility for the timely carrying out of all work.

Stronger Contacts With Operational Practice

The level achieved in agricultural development and the radical qualitative changes in the productive forces in the rural areas objectively require further improvements in the mechanism for land management and in many instances a basically new approach for organizing production. Today, operational practice is confronted by an acute need for scientifically sound methods for optimizing the use of all of the principal resources of agriculture -- land, power engineering and technical equipment, labor. This raises the need for improving such important elements of management as planning, price formation, production stimulation, strengthening cost accounting procedures and improving the mutual contacts between branches which constitute the agroindustrial complex. It was mentioned during the session that the existing trend towards a non-equivalent exchange between agriculture and the other branches of this complex is exerting a restraining effect on the rates for expanded reproduction at the kolkhozes and sovkhozes.

During the session, importance was also attached to developing the normative base more rapidly. Today, in the majority of instances, different norms are being developed for the departments and thus they suffer as a result of their unilateral nature. The task consists of developing norms which will be non-departmental in nature.

Those participating in the session discussed with great interest the fact that the scale and complexity of the tasks confronting science and operational practice, as never before, are underscoring the need for improving the quality of the research and planning-design work. The specific nature of the agricultural science, which includes an extremely broad spectrum of biological, chemical, physical, technical and other problems, all closely linked together, requires that the research efforts be carried out by scientists representing various spheres of knowledge. In this regard, the need becomes apparent for combining the efforts of the scientific collectives of VASKhNIL, the USSR Ministry of Agriculture, the USSR Academy of Sciences, the academies of sciences of union republics and other departments.

The VASKhNIL scientists have accepted as a most important practical task the instruction handed down by the party congress requiring that scientific-research and planning design work be brought into closer contact, both economically and organizationally, with production and that the introduction of scientific discoveries and inventions be viewed as a decisive and very important sector of work. During the session, it was mentioned that scientific production associations have proven themselves to be the most effective and justified form for combining science with production. However, this efficient form is still not being recognized in all areas. In the "portfolios" of many institutes there are still many unrealized works upon which considerable funds have been expended. At the same time, the scientists stressed the importance of rapidly eliminating those factors which are delaying the movement of scientific-technical innovations out onto the fields and farms. In particular, attention was drawn to the fact that their successful introduction is to a large degree dependent upon the availability of new types of machines, equipment, fertilizers, herbicides, feed additives, preservatives and other preparations. However, many of these items are either not being produced whatsoever by our industry or they are being produced only in limited quantities.

The following individuals also partipated in discussing the problem raised during the session: VASKhNIL academicians V.A. Tikhonov and M.I. Sinyukov, corresponding members of VASKhNIL K.V. Novozhilov and N.F. Bondarenko, doctors of science B.I. Poshkus, V.F. Zubenko, L.A. Trisvyatskiy and G.V. Gulyayev and Candidate of Agricultural Sciences M.A. Smurygin.

Politburo member and Secretary of the CC CPSU M.S. Gorbachev delivered a speech before those participating in the session.

In the decree adopted by the session, in the measures for carrying out the decisions handed down during the 26th CPSU Congress and in the positions and tasks advanced by Comrade L.I. Brezhnev in the Summary Report of the CC CPSU, specific measures were defined for raising the efficiency of scientific research and accelerating the use of scientific and engineering achievements in kolkhoz and sovkhoz production.

Those participating in the session enthusiastically adopted the letter to the Central Committee of the CPSU and to the General Secretary of the CC CPSU and the Chairman of

the Presidium of the USSR Supreme Soviet Comrade L.I. Brezhnev, in which they assured the party and government that the scientists are devoting all of their strength, knowledge and experience in the interest of carrying out the majestic socio-economic tasks and improving the welfare of the people in every possible way.

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INTENDED TRENDS IN 11TH FIVE-YEAR PLAN DISCUSSED

Moscow TRAKTORY I SEL'KHOZMASHINY in Russian No 3, Mar 81 pp 1-2

[Article: "At the Beginning of the 11th Five-Year Plan"]

[Text] The workers of the branch of tractor and agricultural machine construction have accepted the resolutions and conclusions contained in the report of the General Secretary of the CPSU Central Committee, Comrade L. I. Brezhnev, to the 26th CPSU Congress as their battle plan of action.

In the course of preparations for the 26th congress socialist competition under the banner of "A Worthy Greeting to the 26th CPSU Congress" was initiated extensively in production associations, enterprises and organizations of ministries.

By the opening day of the 26th CPSU Congress over 10,000 collectives of brigades, sections, shifts, shops and over 300,000 workers of the branch had fulfilled 2-month production plans. Sales for above plan production totalled over 3 million rubles.

A complex of operations has been completed to prepare the manufacture of the new modernized SKD-6 Sibiryak combine and the first industrial lot of 100 machines has been produced in the Krasnoyarsk Production Association for Grain-Harvesting Combines. The Rostsel'mash [Rostov Agricultural Machinery] Production Association has produced the first lot of 200 modernized SK-5A Niva combines and has delivered them to agriculture.

The Minsk Tractor Plant has manufactured eight samples of a new 100-horsepower tractor-cultivator and submitted them for state testing.

The Khar'kov Tractor Plant has produced the first lot of the modernized T-150K tractor for testing in machine-testing stations.

The Khar'kov Motor Construction Production Association, Serp i Molot, has mastered the manufacture of the SMD-20 motor with an increase of 20 percent in capacity.

The Dnepropetrovsk Combine Plant has developed the first models of a self-propelled haulm-harvesters with two-stage haulm cutting.

The first industrial lot of native hydraulic transmissions numbering 200 was produced after production was mastered at the Kirovograd Plant of Tractor Hydraulic Aggregates.

In approving the draft of the CPSU Central Committee, "Basic Directions of Economic and Social Development in the USSR in 1981-1985 and in the Period to 1990," in deeply recognizing their responsibility for fulfilling goals presented for the branch in the decisions of the October 1980 Plenum of the CPSU Central Committee and their role in implementing the foodstuffs program, the workers of this branch have accepted the following socialist obligations for 1981.

To achieve a significant growth in the effectiveness of production and the quality of work on the basis of overall production intensification, a growth in technical supplies for labor, the continued acceleration of scientific-technical progress and economizing on material and energy resources.

To fulfill the 1981 state plan for the sales production volume and production of most of the most important types of tractors and agricultural machines ahead of schedule.

To manufacture additional products in excess of the plan with a consideration of the 17.5 million ruble counterplan, including 1,120 tractors 220 grain-harvesting combines, 275 side-delivery reapers, 50 cotton harvesters, agricultural machinery for 2 million rubles, spare parts for agricultural machines for 1.5 million rubles, consumer goods for 1.3 million rubles.

To secure the early delivery of 22 different types of agricultural machines, spare tractor parts and spare parts for agricultural machines according to the nomenclature that is coordinated with USSR Goskomsel'khoztekhnika [State Committee of the Agricultural Equipment Association] in time for spring field and harvesting operations.

To exceed the goal of growth in labor productivity by 0.2 percent.

To achieve above-plan profits of 3 million rubles and to decrease the cost of production by 0.37 percent.

In implementing measures to fulfill the decisions of the October 1980 Plenum of the CPSU Central Committee, which are directed at raising the technical level of agricultural technology and at improving its quality, dependability and life, to secure the development of at least 96 designations of new agricultural technology, including the PG-3-5 sweep-deep cultivator, the STS-2.1 grain-mineral fertilizer sower, grain-cleaning units with a productivity of 50 and 100 tons per hour, a 4-row self-propelled combine for harvesting potatoes and a 6-row self-propelled haulm-harvesting machine with loading equipment. To complete state testing of the universal class 2 tractor-cultivator with a motor of 150 horsepower.

To secure the manufacture of new agricultural machinery of 38 descriptions, including the Sibiryak combine with the SMD-20 120-horsepower motor, the ZhVN-6A suspension swathing reaper, the SKGD-6 rice-harvesting combine and the small type OUM-4 sprinkler.

To increase the proportion of products belonging to the best category to 25.5 percent of total production and to present no fewer than 18 types of machines, including T-150K tractors, SMD-72 motors and P1-5-35 plows, for attestation with the state Seal of Quality.

With the aim of accelerating the pace of scientific-technical progress, of further raising the technical level of production and of increasing the effectiveness of scientific-research work, through the efforts of the collectives of scientific-research institutes and planning-design organizations together with production and scientific-production associations and enterprises to secure the introduction of 310 new progressive technological processes, 40 automated lines for mechanical processing and 1,885 automatic, semi-automatic, special and unit machine tools. To secure the manufacture of parts using the methods of precise volumetric stamping of no fewer than 252,000 tons.

To increase the number of workers involved in mechanized labor to 55 percent.

By concentrating capital investments and curtailing construction schedules to secure the introduction into operation of 10,400 tractors, 1,500 grain harvesting combines, 37,900 motors and spare parts worth 31.1 million rubles. By means of technically reequipping existing enterprises to surpass by 1 million rubles the goals for increasing production capacities in the manufacture of agricultural machines.

To secure a use coefficient for production capacities of up to 0.96.

To eliminate no fewer than 20,000 jobs by introducing progressive technological processes, equipment and means of production mechanization and by improving labor organization.

To raise the level of mechanization of loading-unloading and transport-storehouse operations to 83.5 percent.

On the basis of improving the organization and technical equipment of labor, to increase the proportion of technically-based output norms to 82.1 percent, to increase the number of workers included in model plans for the organization of work places to 45 percent and to overfulfill the goals of decreasing the labor-intensiveness of commodity production by no less than 5 percent.

To continue to develop brigade forms of organization and the stimulation of labor by providing payments for the final results and to include no fewer than 50 percent of workers in this.

Having begun a broad movement for conservation and for the efficient use of material and fuel-energy resources, to achieve an economy of 4 percent in rolled ferrous metals and 0.3 percent in steel pipes; to save no fewer than 150 million kilowatt hours of electrical energy and 19,000 tons of standard fuel.

To achieve a savings from the introduction of efficiency proposals and inventions totalling no fewer than 83.6 million rubles.

To decrease the idleness of railroad cars on access lines to the enterprise by 0.2 hours of the levels achieved in 1980.

By improving the organization of labor and production and by strengthening labor discipline to decrease losses of work time by 10 percent in comparison with 1980.

To train 16,600 young workers in professional-technical institutes operating in the branch's enterprises and no fewer than 60,200 new workers directly in production; to upgrade the qualifications of 134,400 workers.

To train 34,000 workers in second or related professions.

To put into operation professional-training institutes for 1,440 students.

In fulfilling the plans of social development of labor collectives and complex plans for improving work and everyday conditions, to renovate, construct and put into operation no fewer than 935,000 square meters of residential facilities, preschools for 9,500 children, public cafeterias for 3,670 persons and 57,000 square meters of sanitary-domestic facilities.

To continue the work of developing subsidiary agricultural branches in the branch's enterprises; with the aim of improving foodstuffs supplies to the branch's workers, to double the number of subsidiaries.

To assimilate 3.6 million rubles of capital investments in public health by constructing facilities for preventative medicine and treatment as well as for convalescence.

To more extensively develop the advisor movement, to assign each youth an advisor from among leading workers and engineering-technical workers in order to raise the level of educational work with youth and to recruit young people for production. To make sure that each young worker fulfills his output norms.

To free no fewer than 3,700 persons from difficult and monotonous work

To activate competition to raise the quality of production, to fulfill the complex plan for improving safety conditions on the job on schedule, to fulfill sanitation and health measures and to fulfill collective contracts.

Having initiated extensive socialist competition for the fulfillment and over-fulfillment of 1981 goals, the workers of the branch of tractor and agricultural machine construction are demonstrating, at the beginning of the 11th Five-Year Plan, their limitless devotion to the communist party and their readiness to work tirelessly to realize the great goals of building a communist society.

8228
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TILLING AND CROPPING TECHNOLOGY

IMPLEMENTATION OF DECREE ON IMPROVEMENTS IN NONCHERNOZEM ZONE DISCUSSED

Moscow SEL'SKAYA ZHIZN' in Russian 25 Apr 81 p 2

[Article by P. Shcherbakov: "Accelerated Development for the Nonchernozem Zone"]

[Text] The considerable improvements realized in recent years in developing the productive forces of the nonchernozem zone serve to underscore the tireless attention being given to this vast region by the party and government. 'The CC CPSU and the Soviet Government" stated Comrade L.I. Brezhnev during the 26th CPSU Congress, "have planned and are implementing extensive measures aimed at developing the nonchernozem zone." Further proof of this is the recently adopted decree of the CC CPSU and the USSR Council of Ministers entitled "Further Development of and Improvements in the Efficiency of Agriculture in the Nonchernozem Zone of the RSFSR During the 1981 Period."

During a meeting of the aktiv of workers attached to land reclamation and agricultural organizations in the nonchernozem zone, a speech was delivered on the means and methods for carrying out those tasks resulting from the decisions handed down during the party congress.

In the report delivered by the Deputy Chairman of the RSFSR Council of Ministers A.V. Aleksankin and also in other speeches delivered, emphasis was placed upon the special importance which the party and government are attaching to the implementation of an all-round program for transforming the Russian nonchernozem zone into a region of highly productive farming and animal husbandry.

During the years following the adoption in 1974 of the well known decree of the party and government on the nonchernozem zone, the aquicultural subunits carried out improvements on approximately 5 million hectares, with drainage and irrigation systems being installed on 2 million hectares and soil improvement work carried out on 3 million hectares. Lime was applied to large areas and mineral and organic fertilizer top dressings were also applied. The land reclamation specialists laid down approximately 3,000 kilometers of intra-farm roads. More than 1,000 ponds and reservoirs based upon local runoff were created, 25,000 wells were drilled and 9,000 kilometers of waterlines installed.

The speakers emphasized that it was gratifying to note that land reclamation is being carried out today on a strong scientific basis, with leading experience being taken into account -- on large tracts and in a single nature-protective complex. The

modernization of old drainage and irrigation systems is being carried out on a more extensive scale. The base for the aquicultural associations and mechanized columns is being strengthened. Twenty eight planning-research organizations are in operation and training has been organized at VUZ's and technical schools, at professional technical schools and at training combines for the purpose of developing highly skilled specialists. The state operational subunits have accepted almost all of the intra-farm land reclamation resources for complete technical servicing.

In the Karel'skaya ASSR, up to 35 percent of all crop husbandry output is being obtained from renovated lands, in Leningrad Oblast -- 45 percent and in Kaliningradskaya Oblast -- 95 percent. Today there is not one rayon in which land reclamation work is not being carried out. However, these quantitative indicators, as emphasized in particular during the conference, by no means conceal but quite to the contrary they emphasize the need for raising the return from capital investments and for increasing the cropping power of improved tracts of land.

The productivity of reclaimed lands is still insufficient and the plans for producing grain, vegetables and feed on them are still not being fulfilled in a number of rayons. Glavnechernozemvodstroy is lagging behind with regard to the placing of reclaimed lands in operation. The organizations of RSFSR Goskomsel'khoztekhnika, Rossel'khozkhimiya and certain contractual ministries for sel'khozvodosnabzheniye, for road construction and for supplying the construction projects with material resources have not fulfilled their tasks.

Despite the fact that the quality of the land reclamation work has improved during the past five-year plan, nevertheless it still leaves a great deal to be desired in a number of areas. Last year, for example, more than one third of the projects turned over for operation in Arkhangel'skaya, Ivanovskaya and Tul'skaya Oblasts and in the Udmurtskaya ASSR were assigned an evaluation of only "satisfactory."

In their speeches, the RSFSR Minister of Agriculture L.Ya. Florent'yev, the RSFSR Minister of Land Reclamation and Water Resources K.S. Kornev and other speakers dwelt at length on the important problems associated with further intensification of the nonchernozem zone. A specific task has been assigned to the workers in the nonchernozem zone: by 1985, to increase gross agricultural output by an average of 30 percent compared to the Tenth Five-Year Plan. In order to accomplish this, in particular, it will be necessary to place in operation, within a 5-year period, almost 1.5 million hectares of drained land and 360,000 hectares of irrigated land. In addition, soil improvement work will have to be carried out over large areas. Moreover, the all-round construction of new sovkhozes having well organized settlements, schools, polyclinics and cultural-domestic facilities must be carried out at an accelerated tempo. Considerable improvements must be introduced in the work being performed by the operational aquicultural organizations.

During the meeting a speech was delivered by Candidate Member of the CC CPSU and Chairman of the RSFSR Council of Ministers M.S. Solomentsev.

The USSR Minister of Land Reclamation and Water Resources N.F. Vasil'yev, executives of the CC CPSU and USSR Gosplan and the leaders of a number of ministries and departments all participated in the work of the aktiv.

7026
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EXPERIENCE OF KUBAN' SOVKHOZ IN SOYBEAN TECHNOLOGY DESCRIBED

Moscow SEL'SKAYA ZHIZN' in Russian 7 Apr 81 p 2

/Article by N. Batokhin, director of the Order of Lenin Ladozhskiy Sovkhoz in Ust'-Labinskiy Rayon, Hero of Socialist Labor, and Yu. Semenenko, agronomist, SEL'SKAYA ZHIZN' correspondent, Krasnodarskiy Kray: "Soybeans: According to Industrial Technology"/

/Text/ Crop of Great Potential

Basic Trends in the Economic and Social Development of the USSR for 1981-1985 and for the Period Until 1990 stress the following: "It is necessary to improve the quality of all types of fodder and to concentrate efforts on the solution of the problem of fodder protein, primarily as a result of an expansion of sown areas and a significant increase in the production of peas, alfafa, clover, lupin and soybeans..." The realization of the task set will create conditions for the further development of animal husbandry and will contribute to an improvement of food supply for the population.

The experience of a number of farms in the Kuban', including the Order of Lenin Ladozhskiy Sovkhoz, convincingly attests to the great importance of soybeans and other high-protein fodder crops. Owing to the systematic rise in the output of high-protein fodder, the productivity of livestock and the production of milk and meat increase and their production costs decrease year after year.

The farm began to cultivate soybeans 15 years ago. At first, however, their harvests were low. There were no herbicides and there was a shortage of manpower on the Ladozhskiy Sovkhoz. As is well known, soybeans resist weeds poorly. The yield began to grow steadily as the sovkhoz was provided with herbicides and industrial technology was introduced. The following data eloquently attest to this: During the Eighth Five-Year Plan, on the average, 10.4 quintals of soybeans per hectare were obtained annually, during the Ninth Five-Year Plan, 11.7 and during the 10th Five-Year Plan, 19.8.

The sovkhoz cultivates a number of high-protein crops, which supplement each other well. Soybeans occupy a leading place in this row. This is fully justified, because their absolutely dry seeds, on the average, contain 38 percent of crude protein, 22 percent of fat and more than 20 percent of starch. And what is also important, soybean protein is biologically complete. Its introduction into the ration of animals in the necessary amount ensures an optimum set of amino acids and eliminates the shortage of such a vitally important amino acid as lysine.

The sovkhoz fully utilizes not only the seeds of soybeans, but their straw as well. In its food value it is not inferior to the hay of medium-grade leguminous and cereal grasses. The straw is minced, added to other fodder and fed to large-horned cattle.

Finally, soybeans increase soil fertility considerably, leaving 150 to 200 kg of nitrogen per hectare. After them winter wheat produces 50 quintals of grain per hectare and more.

The harvests of soybean grain totaled 19.8 quintals per hectare during the 10th Five-Year Plan, each hectare producing an average of 5.9 quintals of complete protein, 4.2 quintals of edible oil and about 4 quintals of starch. Let us compare the productivity of soybeans with that of winter barley. Its yield on the farm is not bad--42 quintals per hectare. However, only 336 kg of protein and 17 kg of lysine are obtained from this amount of grain. If it is taken into consideration that the provision of rations with lysine reduces the total expenditure of fodder by 20 percent, a hectare of soybeans is equivalent to a barley harvest of 83 quintals!

Advanced farms obtain even 30 to 35 quintals of soybean seeds per hectare on irrigated areas. A record yield of soybeans in our country was obtained during strain testing on irrigated areas on the Bagizagan Sovkhoz in Samarkandskaya Oblast in 1975-1977. For example, the rannyaya-10 variety developed in the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt under Yu. P. Myakushko's guidance produced 53.5 quintals of seeds per hectare.

With regard to the Ladozhskiy Sovkhoz, its collective has long believed in the great potential of this crop and has persistently increased the yield of the soybean field. At the same time, it should be noted that less than one-half of the crop area on the sovkhoz is irrigated and, moreover, there is not always enough water on irrigated land during moments critical for plants.

The areas sown with soybeans have increased to 500 hectares on the farm in the last 3 years. This is in pure form. However, for a number of years all the corn cultivated for silage on 700 to 715 hectares has also been sown in a mixture with soybeans--it ensures a higher output of the vegetative mass. Practice has shown that both these crops do not compete much with each other, being, so to speak, in different "biological niches," and this contributes to the maximum output of nutritive substances per unit of area. Despite the fact that last year was dry, even then 297 quintals of high-grade green fodder per nonirrigated hectare were obtained. A total of 24,000 tons of high-grade silage (with a plan of 18,000 tons) were stocked for winter.

Ideal succulent fodder for large-horned cattle was obtained. All its nutritive substances are in the necessary combination and quantity. Whereas 1 kg of corn silage prepared on the basis of pure mass contains 12 grams of digestible protein, its content in 1 kg of the mixture reaches 27 grams.

As already stated, workers on the Ladozhskiy Sovkhoz sow several high-protein crops. The Sovkhoz has a total of 12,382 hectares of agricultural land, including 12,221 hectares of arable land. Fodder crops--alfafa, corn and soybeans, as well as some fodder beets and pumpkins--occupy 2,655 hectares, or 20.6 percent of the arable land. The same attention is given to all these crops as to grain and industrial crops.

Peas occupy a prominent place in the structure of the grain field. On this sovkhoz they are sown on up to 1,000 hectares. Incidentally, they are also the object of constant concern. This is the result: During the 10th Five-Year Plan every hectare produced 24.9 quintals of peas.

The expansion of areas and increase in the yield of high-protein crops make it possible to constantly raise the productivity of animals and the production and sale of products to the state. For example, milk yield per cow increased from 2,693 kg during the Eighth Five-Year Plan to 3,171 kg during the 10th Five-Year Plan and in 1980 this indicator reached 3,472 kg. Farm workers are now fighting for the production of 3,600 kg of milk. The fat content and grade of milk have risen. At the same time, the calf crop percent has increased. In 1980 an average of 96 calves per 100 cows and heifers were obtained.

On the Basis of Advanced Agricultural Technology

As a result of the extensive production experiment, constant assistance of the scientists of the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt and creative utilization of domestic and foreign experience, industrial soybean cultivation technology was introduced on the sovkhoz. It is based on a set of inseparably connected agricultural engineering measures for the destruction of weeds, provision of proper plant feeding conditions, retention and accumulation of moisture in soil and provision of optimum crop density.

Soybeans are placed in crop rotation after winter crops, which help to clean fields from weedy vegetation and do not have common pests and diseases with it. Soil cultivation pursues three main objectives: careful hoeing of the plow layer, creation of favorable conditions for the accumulation of nutritive substances and moisture and destruction of as many weeds as possible. In this sense graded cultivation of arable land done in summer produces an excellent result. It begins with stubble breaking done immediately after the harvesting of the predecessor. Stubble breaking promotes moisture conservation and stimulates the growth of weed seeds. Bottom breaking at the depth of 16 to 18 cm with simultaneous harrowing is done after 2 or 3 weeks. Owing to this, weed seedlings are cut and extracted to the surface. If needed (in case of precipitation and appearance of sprouts of weedy grasses), machine operators engage in harrowing or cultivation with steam cultivators and then in deep plowing for winter fallow.

A careful leveling of the field surface is an important unit of agricultural technology. The sovkhoz begins it in fall. P-4 levelers, as well as cultivators ganged up with harrows and wooden or chain coverers, are used. If soil is dessicated and arable land is lumpy, leveling is done repeatedly.

The set of spring field operations begins with field leveling and moisture conservation by heavy harrows hitched to coverers. If weed sprouts are detected, it is best to use VNIS-R harrows--very heavy implements, to whose teeth segments from cutters are welded from below.

Fields are treated with the herbicide treflan in a dose of 1.5 kg of the active substance per hectare 1 or 2 days before sowing. It suppresses many weeds, but, unfortunately, is almost powerless against sowthistle, ragweed, Chinese bellflower and nightshade. Sencor is effective in controlling them. A mixture of

treflan and sencor was used a few years ago; the former, in a dose of 1 kg and the latter, 0.5 kg of the active substance per hectare. However, farms have not received sencor in the last few years. Therefore, it is necessary to use preemergence harrowing and on some plots interrow cultivation as well.

It is exceptionally important to observe the prescribed herbicide concentration. To attain this, sovkhoz experts have made a dissolving unit and equipped the capacities for the transportation of the solution with simple, but well operating, mixers. It is important that they rotate continuously as long as there is a chemical solution in the barrels. Instead of metal barrels plastic barrels not subject to corrosion have been installed. Booms, sprayers and some other parts of herbicide machines, which are made at plants from low-grade steel and rust quickly, have been replaced by parts from chemically stable materials--stainless steel, plastic and bronze. As a result, a careful spraying and an even distribution of the preparation over the entire cultivated area are ensured.

Reequipped GAN-15 and POU machines, which are ganged up with disk-type stubble breakers and coverers, are used for this. The working elements of these machines immediately mix well volatile treflan with soil and pack it, as it were, in the upper horizon. The depth of cultivation is 5 to 6 cm. Steam cultivators, on which, instead of ordinary blades, two-sided blade working elements are mounted, are used for this. They loosen soil better and, at the same time, prevent herbicide evaporation. Blades are placed so that they create a firm bed, on which seeds are piled later.

Sowing on the sovkhoz located in the central zone of the Kuban' is done when soil at the depth of seed placement is warmed up to no less than 14 degrees. An earlier time is fraught with seed spoilage. Sowing should not be late, because then the harvesting time will also be delayed unnecessarily. Locally produced first-grade seeds of the first to the third reproduction are used for sowing. The sovkhoz receives elite seeds from the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt and reproduces them on irrigated plots.

Basically, sowing is done by SPCh-8 seeders with row spacings of 70 cm. This applies primarily to seed growing plots and areas on nonirrigated land. On irrigated land row spacings are left at 45 cm. Reequipped SPCh-8 seeders, on which, in addition, three sowing apparatus are placed, are used in this case.

Mixed sowing has its own characteristics. The same seeders are used for this on the sovkhoz. Only instead of mineral fertilizers soybean seeds are placed in boxes and corn seeds, in jars. Thus, the seeds of both crops are sown in one row. However, since boots have separate outlets for fertilizers and grain, soybean and corn seeds are placed in soil at a distance of 2 to 3 cm from each other on both sides of the axial line of a row.

Seeders are set at a seeding rate so as to ensure 280,000 to 300,000 plants per hectare on nonirrigated land and 350,000 to 400,000, on irrigated plots.

Usually, sowing lasts no more than 5 days. In order to attain the prescribed density and even placement of plants in a row, machine operators drive the units at the same speed of 3 to 3.5 kg per hour.

One month before sowing seeds are mandatorily disinfected with the wetting preparation TMTD and on the day of sowing are treated with nitragin of strain 646, which increases the harvest by 2 to 3 quintals per hectare.

Soybeans are extremely responsive to fertilizers. The total dosage of mineral fertilizers (in the active substance) per hectare is as follows: 30 kg of nitrogen, 60 kg of phosphorus and 30 kg of potassium. At the same time, phosphorus and potassium fertilizers are applied under basic tillage, while nitrogen fertilizers are placed in soil in spring under cultivation and are sown with seeds. It is very important to strictly observe the conditions of field moistening. Soybeans are especially sensitive to the availability of moisture at the phases of budding, fruit formation and grain swelling. Irrigation by means of Volzhanka and Fregat units is carried out during these critical periods.

The human hand does not touch the plants again until fall. Harvesting is done by direct combining. The conclusion of the sovkhoz laboratory that seed moisture is reduced to 16 percent serves as a signal for the beginning of this work. SK-4 and Niva single-drum combines, which traumatize the tender soybean grain to a lesser extent, are used. At the same time, the rate of rotation of the threshing drum is lowered to 450 or 500 rpm if seed moisture is below 12 percent. When moisture is higher, there are 550 to 600 revolutions.

After harvesting seeds are immediately cleaned on ZAV-20 and ZAV-40 machines and, if needed, are dried. As a rule, ventilated hoppers assembled on the central mechanized threshing floor are used for drying. Air heated up to 28 or 32 degrees is supplied to them. The productivity of a hopper is 75 tons in 24 hours. All seed grain is dried on this unit. If the moisture of fodder seeds is more than 15 percent, high-temperature drying units of the AVM type are used.

Making Way for the New and the Progressive

The sovkhoz has its own strain testing plot, where dozens of soybean varieties of domestic and foreign selection are tested. This work also continues now. Furthermore, production strain testing is carried out constantly. The varieties of the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt produce the highest harvest. The rannyaya-10 variety is sown primarily in pure form and komsomolka occupies about 60 hectares.

The volna variety, which the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt handed over to the state strain testing network in 1978, has evoked great interest among the kray's specialists. Its productivity and length of stem correspond to the level of komsomolka and the period of vegetation is exactly 1 month shorter. Experiments have shown that the new variety ripens for seeds, being sown after the harvesting of grass-legume mixtures and other grasses harvested at an early time. As the main crop this soybean variety can ripen in Rostovskaya, Volgogradskaya, Saratovskaya and other oblasts and in the Kalmytskaya ASSR. The bystritsa variety, which the All-Union Scientific Research Institute of Oil Bearing Crops imeni V. S. Pustovoyt transferred for strain testing in 1979, is exceptionally promising for cultivation as a stubble crop for the country's southern zones and as the main crop for more northern regions. Its vegetative period is 85 days.

On the sovkhoz soybeans are concentrated on large areas. Experienced machine operators--such as M. I. Nikitchenko, A. V. Lebedev and others--cultivate them. They have studied the methods of industrial technology in detail and willingly transmit their knowledge to others. There is a great need for this, because the Ladozhskiy Sovkhoz has become the kray's school for the introduction of effective agricultural technology of soybean cultivation. Seminars are held regularly and courses for specialists and machine operators are organized there.

Industrial technology has been established not only in the soybean fields of the Ladozhskiy Sovkhoz. It is successfully used on a number of farms in Ust'-Labinskiy, Novokubanskiy, Krasnoarmeyskiy, Kurganinskiy, Bryukhovetskiy, Gul'kevichskiy and other rayons. It is not accidental that 18 to 20 quintals of soybean grain per hectare and more have been gathered there in the last few years.

Soybean areas in the Kuban' increase mainly as a result of an improvement in the structure of sown land. Last year this crop in pure form occupied 28,500 hectares. On several tens of thousands of hectares farms grew it in a mixture with corn. Now the soybean field has slightly extended its limits and will occupy 30,000 hectares and industrial technology will be used on its entire area.

Soybean growers also face other difficulties. We have already discussed the shortage of herbicides. But with what should they be applied? Frankly speaking, series machines are not suitable for this purpose. The industry does not at all manufacture mechanisms for solution preparation and capacities with mixers for the delivery of herbicides to the field. Combined units, which prepare soil for sowing in one operation, bringing it up to an ideal state, can be seen on some farms. However, why are they not made at the enterprises of the Ministry of Tractor and Agricultural Machine Building? Here is another question addressed to the same ministry: When will there be manual-type reapers and special combines operating in a soft regime? After all, it is not right that, owing to the imperfection of harvesting equipment, up to 5 or 7 percent of the harvest is now lost and, no matter how equipment is controlled, up to 10 percent of the seeds are damaged! The problem of mechanization of postharvest processing of soybeans, especially their drying, also requires a solution. As yet there are no special dryers.

This year the sovkhoz collective intends to gather no less than 18 quintals of soybean grain per nonirrigated hectare and 25 to 27 quintals, per irrigated hectare. A great deal has already been done to attain these indicators.

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